WHAT IS CLAIMED IS:

1. A method of treating multiple sclerosis, the method comprising administering to a subject in need thereof a therapeutically effective amount of a compound, said compound having:

(a) a combination of molecular weight and membrane miscibility properties for permitting said compound to cross the blood brain barrier of the organism;

(b) a readily oxidizable chemical group for exerting antioxidation properties; and

(c) a chemical make-up for permitting said compound or its intracellular derivative to accumulate within the cytoplasm of cells.

2. The method of claim 1, wherein said compound is selected from the group consisting of N-acetyl cysteine ethyl ester (compound *A*), β,β-dimethyl cysteine ethyl ester (compound *B*), N-acetyl-β,β-dimethyl cysteine (compound *C*), Glutathione ethyl ester (compound *D*), N-acetyl glutathione ethyl ester (compound *E*), N-acetyl glutathione (compound *F*), N-acetyl α-glutamyl ethyl ester cysteinyl glycyl ethyl ester (compound *G*) N-acetyl α-glutamyl ethyl ester cysteinyl glycyl (compound *H*), N-acetyl glutathione amide (compound *I*), N-acetyl cysteine amide (compound *J*), N-acetyl β,β dimethyl cysteine amide (compound *K*) and N-acetyl cysteine glycine amide (compound *L*).

3. The method of claim 1, wherein said readily oxidizable chemical group is a sulfhydryl group.

4. The method of claim 1, wherein said chemical make-up is selected having an ester moiety which is removable by hydrolysis imposed by intracellular esterases.

5. The method of claim 4, wherein said ester moiety is selected from the group consisting of alkyl ester and aryl ester.

6. The method of claim 5, wherein said alkyl and aryl esters are selected from the group consisting of methyl ester, ethyl ester, hydroxyethyl ester, t-butyl ester, cholesteryl ester, isopropyl ester and glyceryl ester.

7. A method of therapeutically or prophylactically treating a subject against multiple sclerosis, the method comprising administering to the individual a therapeutically or prophylactically effective amount of an antioxidant compound, said antioxidant compound having:

(a) a combination of molecular weight and membrane miscibility properties for permitting said compound to cross the blood brain barrier of the individual;

(b) a readily oxidizable chemical group for exerting antioxidation properties; and

(c) a chemical make-up for permitting said compound or its intracellular derivative to accumulate within brain cells of the individual.

8. The method of claim 7, wherein said compound is selected from the group consisting of N-acetyl cysteine ethyl ester (compound *A*), β,β-dimethyl cysteine ethyl ester (compound *B*), N-acetyl-β,β-dimethyl cysteine (compound *C*), Glutathione ethyl ester (compound *D*), N-acetyl glutathione ethyl ester (compound *E*), N-acetyl glutathione (compound *F*), N-acetyl α-glutamyl ethyl ester cysteinyl glycyl ethyl ester (compound *G*) N-acetyl α-glutamyl ethyl ester cysteinyl glycyl (compound *H*), N-acetyl glutathione amide (compound *I*), N-acetyl cysteine amide (compound *J*), N-acetyl β,β dimethyl cysteine amide (compound *K*) and N-acetyl cysteine glycine amide (compound *L*).

9. The method of claim 7, wherein said readily oxidizable chemical group is a sulfhydril group.

10. The method of claim 7, wherein said chemical make-up is selected having an ester moiety which is removable by hydrolysis imposed by intracellular esterases.

11. The method of claim 10, wherein said ester moiety is selected from the group consisting of alkyl ester and aryl ester.

12. The method of claim 11, wherein said alkyl and aryl esters are selected from the group consisting of methyl ester, ethyl ester, hydroxyethyl ester, t-butyl ester, cholesteryl ester, isopropyl ester and glyceryl ester.

13. A pharmaceutical composition for therapeutically or prophylactically treating a subject against multiple sclerosis, the composition comprising a pharmaceutically acceptable carrier and, as an active ingredient, a therapeutically or prophylactically effective amount of an antioxidant compound, said compound having:

(a) a combination of molecular weight and membrane miscibility properties for permitting said compound to cross the blood brain barrier of the individual;

(b) a readily oxidizable chemical group for exerting antioxidation properties; and

(c) a chemical make-up for permitting said compound or its intracellular derivative to accumulate within brain cells of the individual.

14. The pharmaceutical composition of claim 13, wherein said compound is selected from the group consisting of N-acetyl cysteine ethyl ester (compound *A*), β, β-dimethyl cysteine ethyl ester (compound *B*), N-acetyl-β,β-dimethyl cysteine (compound *C*), Glutathione ethyl ester (compound *D*), N-acetyl glutathione ethyl ester (compound *E*), N-acetyl glutathione (compound *F*), N-acetyl α-glutamyl ethyl ester cysteinyl glycyl ethyl ester (compound *G*) N-acetyl α-glutamyl ethyl ester cysteinyl glycyl (compound *H*), N-acetyl glutathione amide (compound *I*), N-acetyl cysteine amide (compound *J*), N-acetyl β,β dimethyl cysteine amide (compound *K*) and N-acetyl cysteine glycine amide (compound *L*).

15. The pharmaceutical composition of claim 13, wherein said pharmaceutically acceptable carrier is selected from the group consisting of a thickener, a buffer, a diluent, a surface active agent and a preservatives.

16. The pharmaceutical composition of claim 13, wherein said readily oxidizable chemical group is a sulfhydril group.

17. The pharmaceutical composition of claim 13, wherein said chemical make-up is selected having an ester moiety which is removable by hydrolysis imposed by intracellular esterases.

18. The pharmaceutical composition of claim 17, wherein said ester moiety is selected from the group consisting of alkyl ester and aryl ester.

19. The pharmaceutical composition of claim 18, wherein said alkyl and aryl esters are selected from the group consisting of methyl ester, ethyl ester, hydroxyethyl ester, t-butyl ester, cholesteryl ester, isopropyl ester and glyceryl ester.